

Climate Action Plan

City of Phoenix Operations



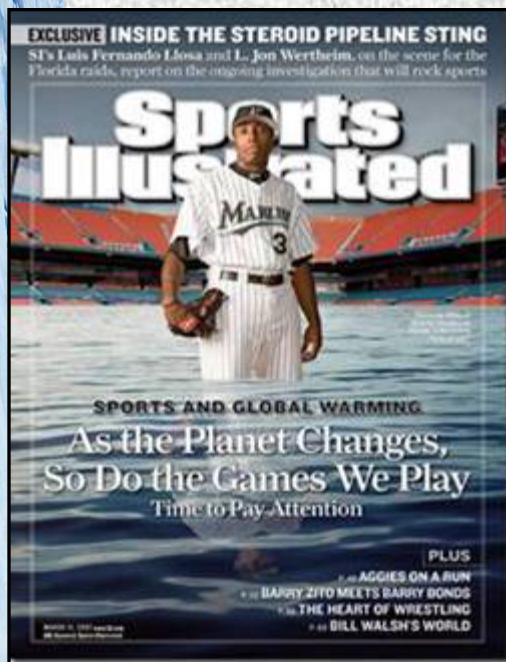
Commitment to Sustainability

■ Sustainability Summary: 80 Programs

- Air quality
- Water conservation
- Land-use and smart growth
- Parks and open space
- Pollution prevention
- Recycling
- Energy conservation
- Renewable energy

See: Phoenix.gov/sustainability





City Role in Climate Protection

- U.S. Mayors' Climate Protection Agreement
- AZ Governor's Climate Advisory Group
- Western Climate Initiative
- Center for Clean Air Policy, Urban Adaptation
- ICLEI Local Governments for Sustainability
- Climate Action Plan for City Operations



Climate Action Plan

■ Competitive Bid Selection

- Cost: \$117,000
- Schedule: 18 months

■ Staff Resources

- Project Manager
- 2 staff (lost to budget cuts)



Council-Approved Approach


- **Focus on City Operations**
- **Achievable vs Aspirational Goal**
 - Realistic and achievable measures
 - Responsibility to maintain public trust
- **Goal Based on Scientific Accounting**
 - Inventory & impact of measures used to set goal



Emissions Inventory Protocol


- **2008 Local Government Operations Protocol**
 - ICLEI Cities for Sustainability
 - CA Air Resources Board (CARB)
 - CA Climate Registry
 - The Climate Registry
- **Consistent National Approach**
 - Standardized emission factors
 - Operational vs Financial Control
 - GHG Direct and Indirect Sources (Scope 1,2 & 3)

Clean Air Climate Protection Software (ICLEI)

 Clean Air and Climate Protection Software©

File Year Record Report Settings Assistants Help

Community Analysis **Community Measures** **Government**





 **Government Analysis for Year 2005**



Buildings Vehicle Fleet Employee Commute Streetlights Water/Sewage Waste Other

Name of Vehicle or Vehicle Group
Untitled

Record Controls


Insert **Select** **Delete**


 **Report**  **Help**


Assistants Categories Indicators Coefficients


Coefficient Sets Used by This Group


 **Average Grid Electricity Set**


12 - Western Systems Coordinating Co. **Select**




 **View/Edit Contents**

 Marginal Grid Electricity Set

 Transport Average Set

 Fuel CO2 Set

 User-Defined Set

Fuel Type	Units		
Gasoline	(thousand vehicle-miles)		
VehicleType	Quantity	Energy Cost (\$)	
Auto - Full-Size	0	0	
Auto - Mid-Size	0	0	
Auto - Sub-Compact/Compact	0	0	
Heavy Truck	0	0	
Light Truck/SUV/Pickup	0	0	
Motorcycle	0	0	
Passenger Vehicle	0	0	
Vanpool Van	0	0	
Diesel	(thousand vehicle-miles)		
Biodiesel (B-20)	(thousand vehicle-miles)		

Notes Regarding Vehicle or Group Data

Energy Consumption (MMBtu)

Equivalent CO₂ Production (tons)

Cost (\$)

NC

Emissions Inventory Approach

- **Operational Control - Sources Not included**
 - Leased Facilities
 - Public Housing
 - City owned property leased to others
 - Rental Car Facility at Sky Harbor
 - Lessees responsible for energy use
 - 1-2 City staff

Emissions Inventory Approach

■ Operational Control - Optional Sources

- Sky Harbor Airport

- Leased to airlines and associated retail

vs

- 800 employees at airport
 - Aviation Department commitment to lower GHG

Emissions Inventory Approach

■ Operational Control - Optional Sources

- 91st Ave Wastewater Treatment Facility
 - SCROG Ownership – Joint Powers of Attny
- vs**
- *Phoenix staff operate*
 - *Air and water permits issued to Phoenix*
 - *Digester gas project offers GHG reduction*

Emissions Inventory

- **Base Year Emissions Inventory: 2005**
 - Most accurate data available

- **Forecast Future Growth: 2015**
 - Reasonable growth estimates
 - Information on upcoming regulations
 - New planned and proposed city programs

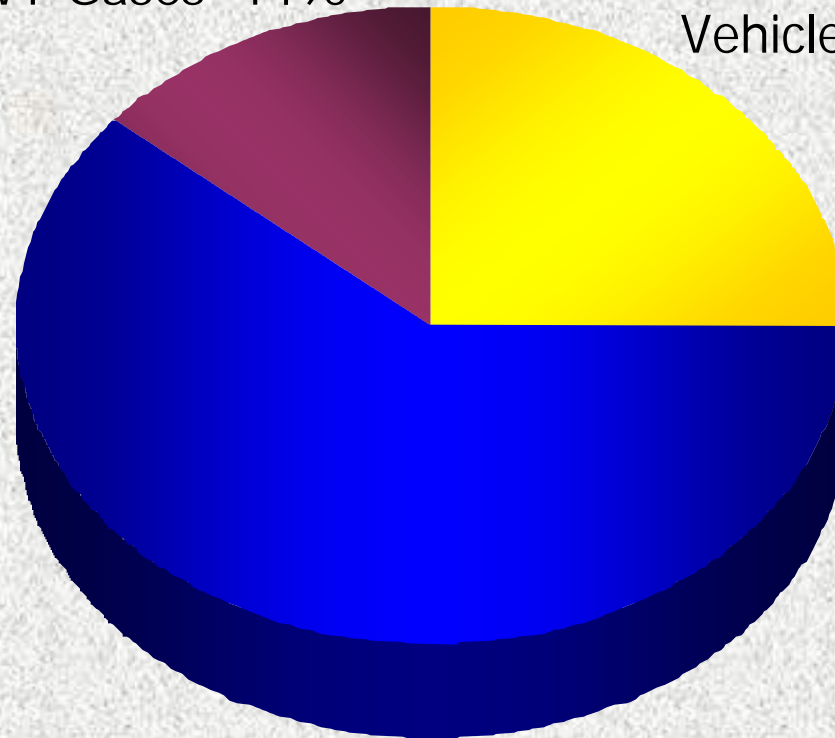


Greenhouse Gas Emissions

City of Phoenix Operations 2005

Landfill & WWT Gases 14%

Vehicles 25%



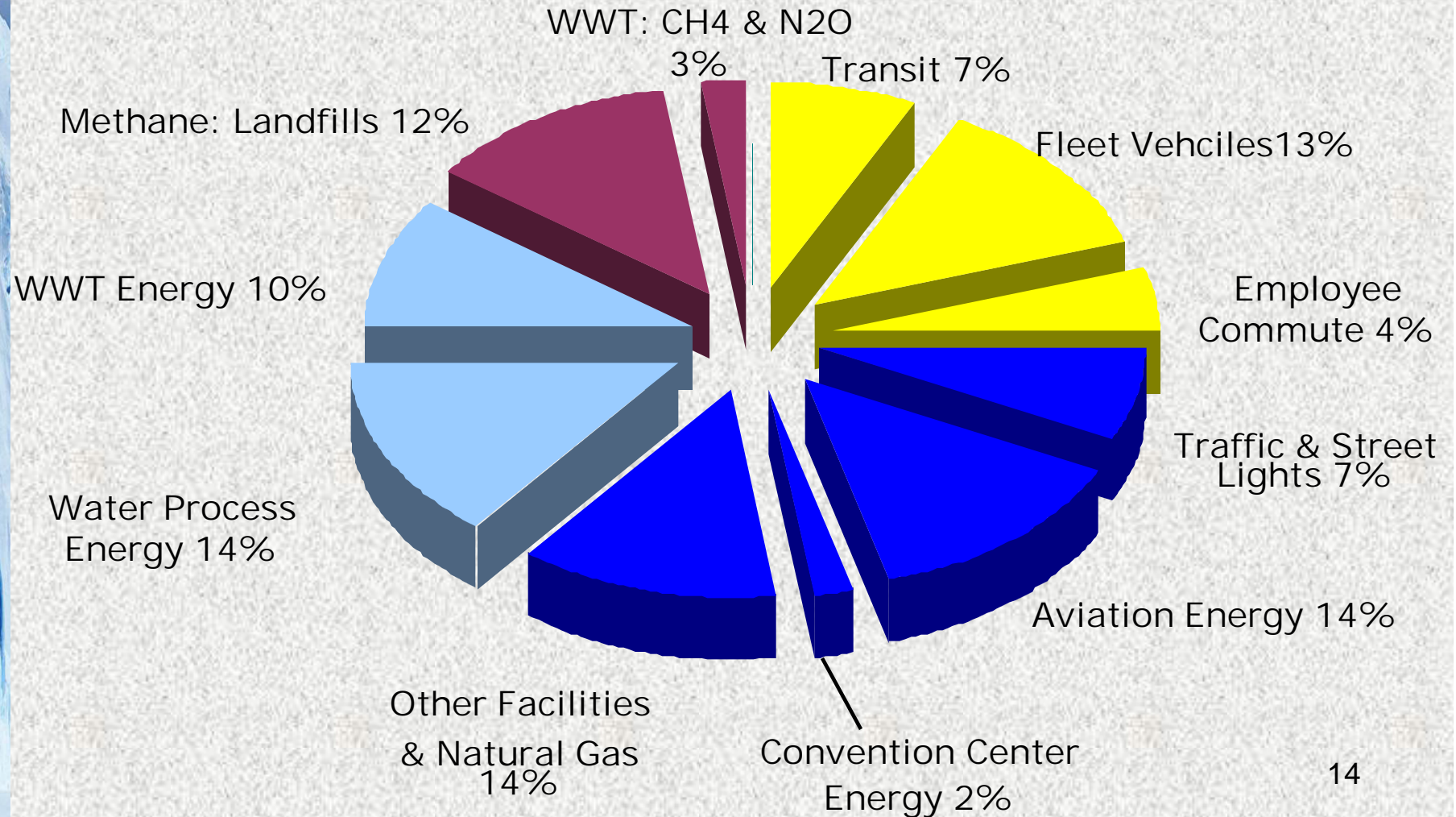
Energy Use 61%



Greenhouse Gas Emissions

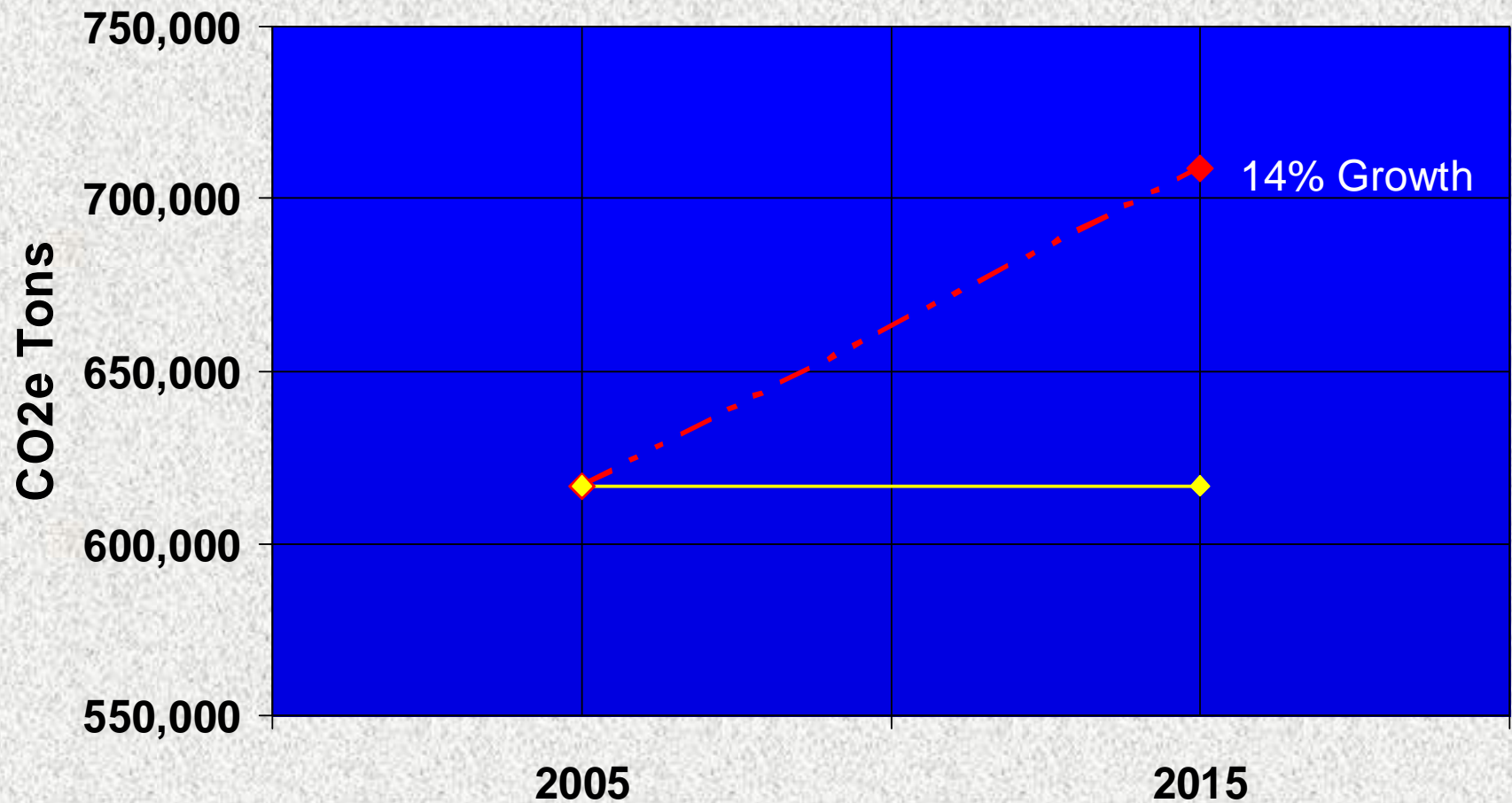
City of Phoenix Operations 2005

618,682 CO₂e Tons



City of Phoenix Operations

Growth in GHG Emissions



◆ Forecast Growth: 706,416 ■ Maintain 2005 Levels: 618,682

Selection of Measures

- **Review 80 Sustainability Measures**
- **Department "Best Bets" Project**
 - Aggressive / achievable new measures
 - New Sustainability Council Subcommittee

Selection of Measures

- **ICLEI Review of Other Cities**
- **Climate & Air Pollution Planning (CAPPA)**
 - More than 100 measures
 - Allows input of local data
 - Regional energy grid (EPA e-grid)
 - Energy cost
 - Specific technologies

ICLEI Climate & Air Pollution Planning Assistant (CAPPA)

Government Operations

1,000 Street Lights Replaced with LED Street Lights

Cost Impacts

The default values below are based on the reported collective experience of US local governments throughout the ICLEI network. CAPPA will assist you in estimating emissions and cost impacts and developing a local climate action plan based on these values. Adjust as appropriate to your local circumstance by editing the blue cells below.

Government Operations

\$	0.0988	Price of Electricity (\$ per kWh)
	264	Annual Energy Savings of one LED Street Light (kWh)
	\$602	Incremental Cost to Purchase an LED Street Light
	264,000	Total Annual Energy Savings (kWh)
	\$26,083	Annual Cost Savings
	23.1	Simple Payback (years)

Save Changes

Restore Defaults

Associated Annual Greenhouse Gas and Criteria Air Pollutant Emissions Reductions

The values below are calculated using default emissions factors consistent with those contained in the Clean Air and Climate Protection software.

Select Utility
Region

WECC California (CAMX)

Government Operations

CO2e (metric tons)	NOx (lbs)	SOx (lbs)	CO (lbs)	VOCs (lbs)	PM10 (lbs)
105	200	148	149	17	132

Per Unit Reductions

CO2e (metric tons) per light	NOx (lbs) per light	SOx (lbs) per light	CO (lbs) per light	VOCs (lbs) per light	PM10 (lbs) per light
0.11	0.20	0.15	0.15	0.02	0.13

View Complete
Emission
Coefficients Set

ICLEI Climate & Air Pollution Planning Assistant (CAPPA)

Government Operations

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	\$602	Incremental Cost to Purchase an LED Street Light
	264,000	Total Annual Energy Savings (kWh)
	\$26,083	Annual Cost Savings
	23.1	Simple Payback (years)

Save Changes

Restore Defaults

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CO2e (metric tons)	NOx (lbs)	SOx (lbs)	CO (lbs)	VOCs (lbs)	PM10 (lbs)
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0.11	0.20	0.15	0.15	0.02	0.13

View Complete
Emission
Coefficients Set

ICLEI Climate & Air Pollution Planning Assistant (CAPPA)

Community

500 Homes Weatherized

Cost Impacts

The default values below are based on the reported collective experience of US local governments throughout the ICLEI network. CAPPA will assist you in estimating emissions and cost impacts and developing a local climate action plan based on these values. Adjust as appropriate to your local circumstance by editing the blue cells below.

Community

\$	0.1094	Price of Electricity (\$ per kWh)
\$	1.55	Price of Natural Gas (\$ per therm)
	1,300	Energy Savings per Home (kWh)
	222	Energy Savings per Home (therms)
	\$7,009	Program Cost (\$ per home)
	650,000	Total Annual Electricity Savings (kWh)
	111,000	Total Annual Natural Gas Savings (therms)
	\$486	Annual Cost Savings per Home
	\$243,160	Total Annual Cost Savings
	14.4	Simple Payback (years)

Save Changes

Restore Defaults

Associated Annual Greenhouse Gas and Criteria Air Pollutant Emissions Reductions

The values below are calculated using default emissions factors consistent with those contained in the Clean Air and Climate Protection software.

Select Utility
Region

WECC California (CAMX)

Community

CO ₂ e (metric tons)	NO _x (lbs)	SO _x (lbs)	CO (lbs)	VOCs (lbs)	PM ₁₀ (lbs)
881	2,358	438	849	144	382

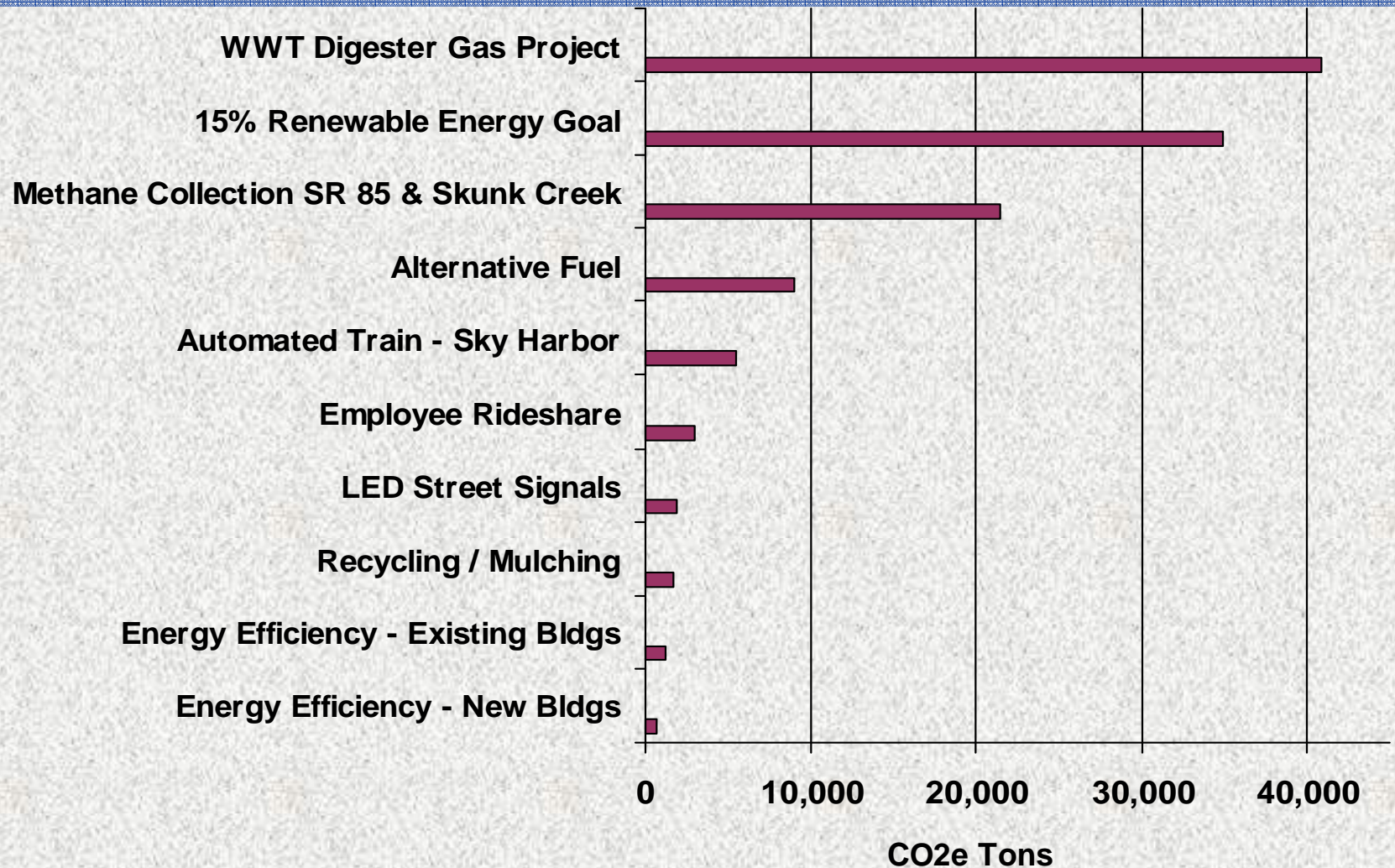
View Complete
Emission
Coefficients Set

Per Unit Reductions

CO ₂ e (metric tons) per home	NO _x (lbs) per home	SO _x (lbs) per home	CO (lbs) per home	VOCs (lbs) per home	PM ₁₀ (lbs) per home
1.76	4.72	0.88	1.70	0.29	0.76

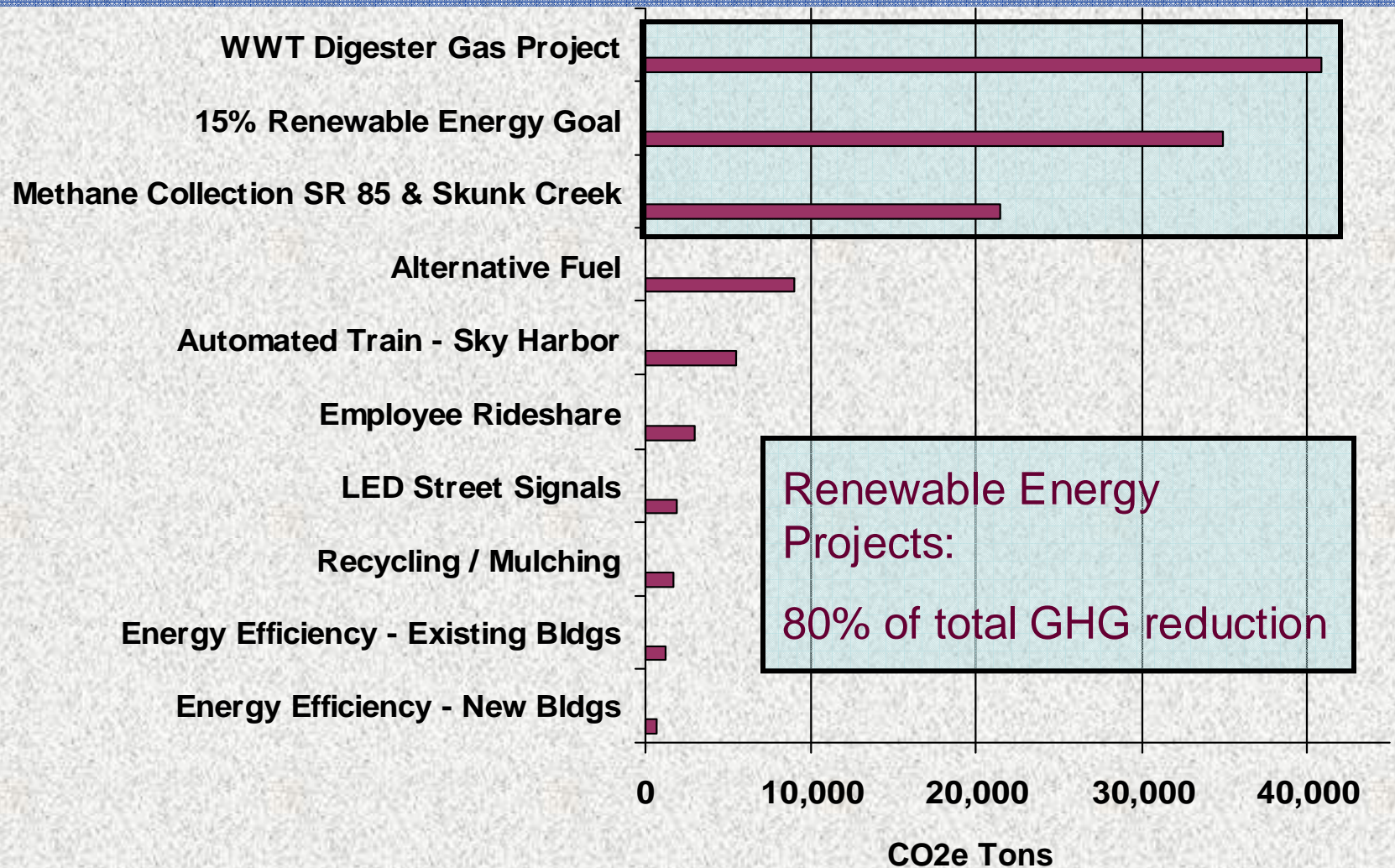
Selected Measures

GHG Reduction in 2015



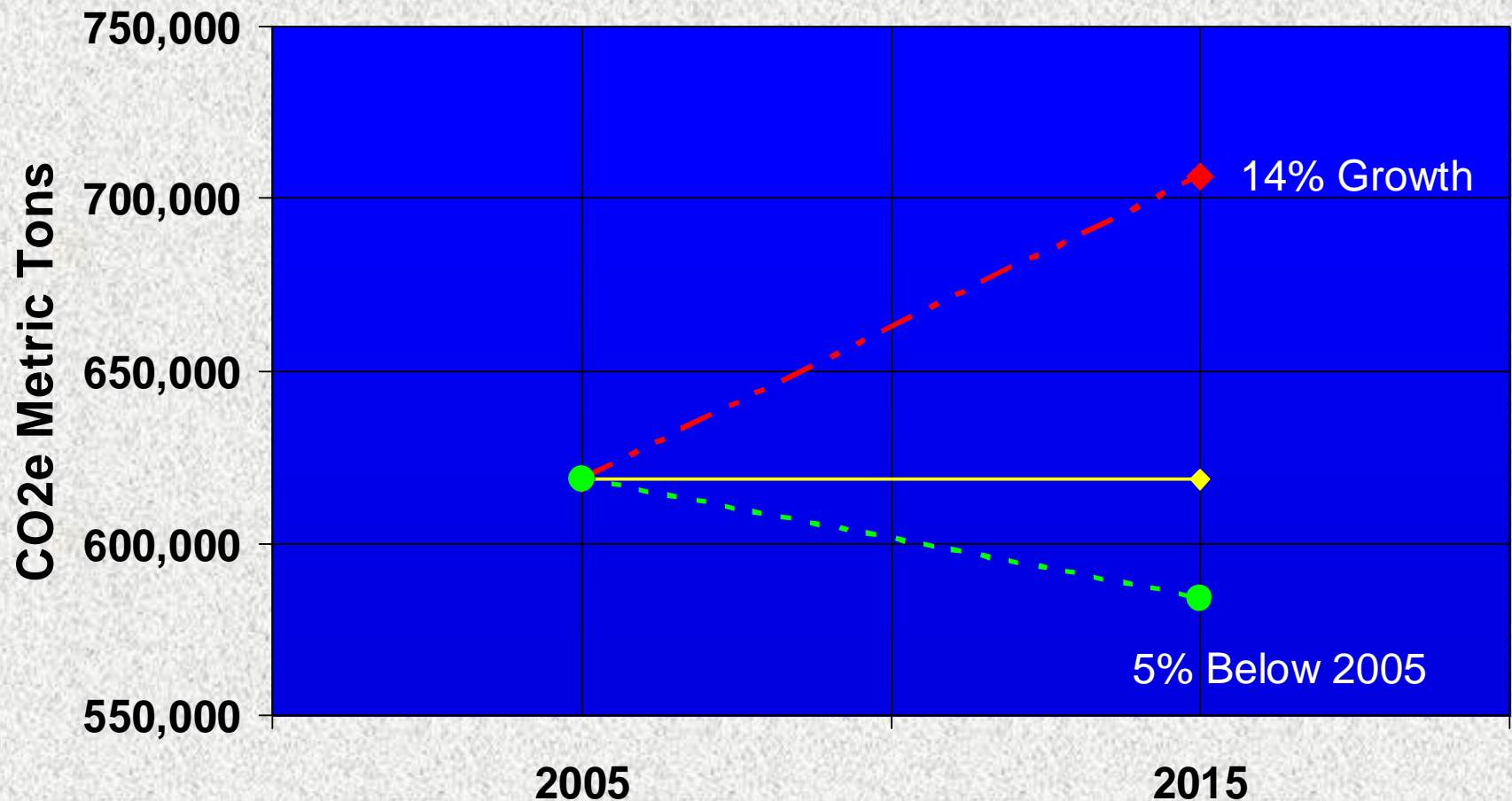
Selected Measures

GHG Reduction in 2015



City of Phoenix Operations

GHG Impact of Measures in 2015



◆ Forecast Growth: 706,416 tons ■ Maintain 2005 Levels: 618,682
● Reduction from Measures: 120,428

Goal Approved by Council

December 17, 2008

**Reduce GHG emissions
from City operations
to
5% below the 2005 levels
by 2015.**

Resolution No. 50759



Selection of Measures

■ Phoenix Plan: Focus on Broad Measures

- 15% Renewable Energy Goal
- Green Building Standard

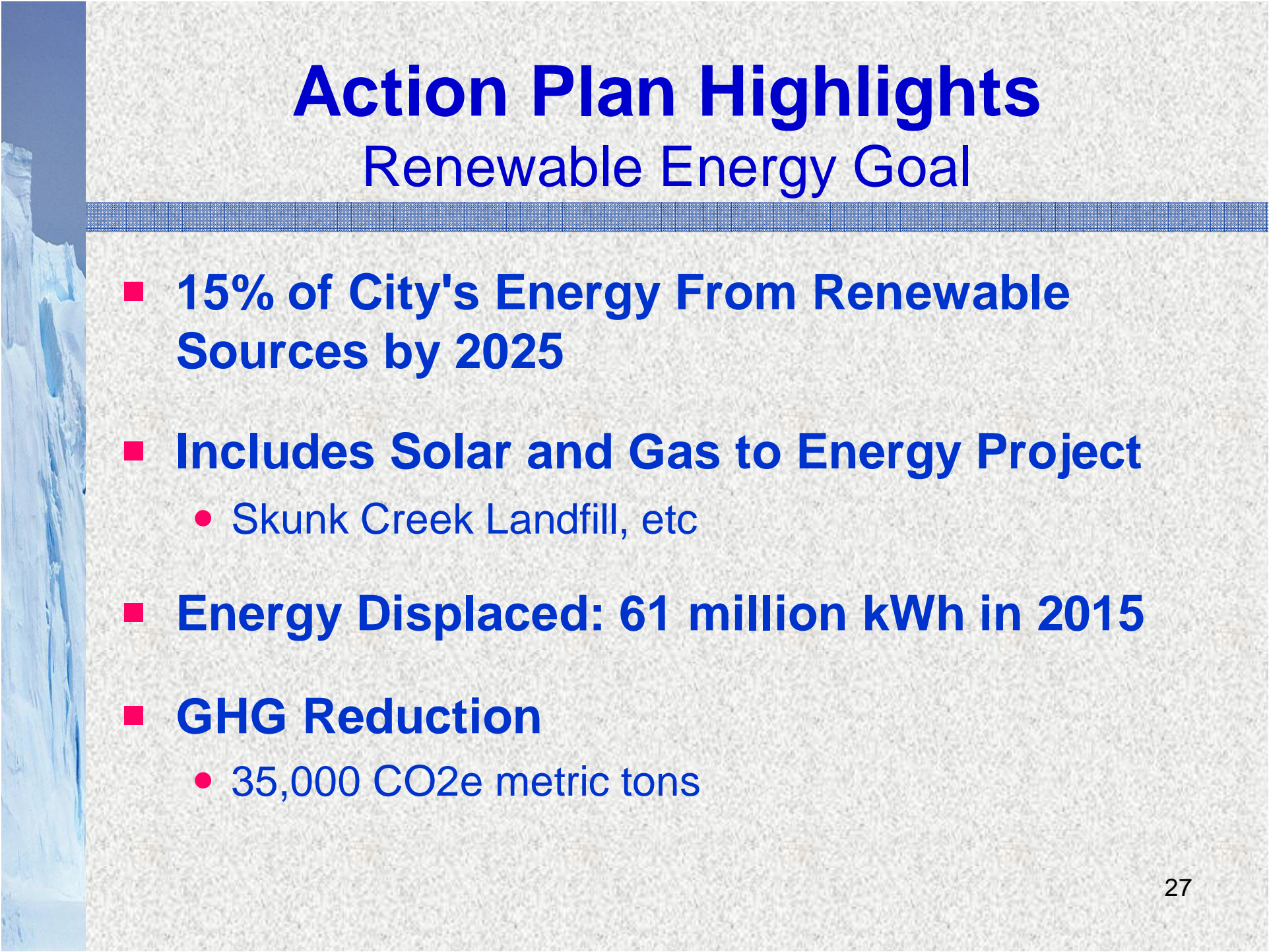
■ Funding Impact

- \$156 M budget cuts in 2008/09
- Small changes to selected measures
 - Fewer ethanol fuel tanks
 - Less funding for LED traffic signals

Action Plan Highlights

Renewable Energy: WWT Gas to Energy

- **91st Avenue WWT Plant**
 - Digester gas contract under negotiation
 - Methane cleaned on site
 - Sold to electrical utility company
- **23rd Avenue WWT**
 - RFQ underway for joint project
 - May be combined with 27th Ave Landfill
- **GHG Reduction**
 - 40,916 CO₂e metric tons



Action Plan Highlights

Renewable Energy Goal

- **15% of City's Energy From Renewable Sources by 2025**
- **Includes Solar and Gas to Energy Project**
 - Skunk Creek Landfill, etc
- **Energy Displaced: 61 million kWh in 2015**
- **GHG Reduction**
 - 35,000 CO2e metric tons

Action Plan Highlights

Green Buildings & Energy Conservation

- **Construction Standard City Buildings (2005)**
 - LEED Standard
 - 14% less energy
 - Low-use water fixtures
- **11 LEED buildings**
 - 1 Silver, 1 Gold
 - 2 Certified, 7 Pending
- **GHG Reduction**
 - 1,912 CO₂e metric tons
 - New and existing buildings



Fire Station 50, 20225 N

35th Ave

Action Plan Highlights

Alternative Fuels

■ Current Program

- More than 3,000 alternative fuel vehicles
- 12 Million gallons alternative fuel/year (FY 08/09)
- 16 CNG fueling sites

■ Action Plan

- Biodiesel in fleet and equipment
- 75 Biodiesel fueling sites
- Expand ethanol fleet & fuel tanks
- GHG Reduction
 - 9,028 CO₂e metric tons



Next Steps

- **Finalize Action Plan: October 2009**
- **Add to Phoenix.gov website**
- **Track Progress of Action Plan Measures**
- **Update Plan with New Programs**
 - Federal Stimulus Grants
 - EPA Solar Grants
 - SR-85 Landfill Solar & Gas to Energy



New Projects

Renewable Energy Projects

- **Current: 10 Solar Projects Completed (280 kW)**
- **Proposed Solar Project at SR 85 Landfill**
 - 1,200 acres available
 - Estimated output 150-200 MW
 - 20-30 years
- **\$15.2 Million Energy Efficiency & Conservation Block Grant (DOE)**
 - Energy Audits & Solar Projects – 1.2 MW



Climate Action Map - Windows Internet Explorer provided by City of Phoenix

http://www.climateactionmap.org/#

File Edit View Favorites Tools Help

Climate Action Map

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ClimateActionMap.org

Visible Projects Search Filters

Project Name Cat

- 40th Street and Pecos Park & Ride
- North Gateway Transfer Station
- Phoenix Alternative Fuels Program - Aviation
- Phoenix Convention Center
- Water Conservation
- Water Resource Planning
- Rio Salado
- Metro Light Rail
- HOPE VI Revitalization Project
- Phoenix Fire Station #50
- Desert Broom Library
- Cesar Chavez Library
- Burton Barr Library
- ASU Walter Cronkite School of Journalism
- Phoenix Civic Space Park
- Bag Central Station
- Tres Rios Constructed Wetlands
- Skunk Creek Landfill
- South Mountain Park
- North Mountain Park Visitor Center
- Pecos Community Center
- Phoenix Brownfields Site - Metro North Park
- Phoenix Brownfields Site - Ace

Skunk Creek Landfill

A 3,000 kilowatt power-generating plant is planned at the closed Skunk Creek Landfill utilizing methane gas from the site's own gas collection system.

Installed in 2009

Map Satellite Hybrid Terrain

Main Info Images

KL

POWERED BY Google

Map data ©2009 Google - Terms of Use

Done

Internet 100%

Start 3 Microsoft Po... Gaye Knight - In... Blue Sky Alt Fuel... Climate Action... Desktop 11:28 AM

Next Steps

- **Finalize Action Plan: Spring 2009**
- **Monitor State and National Programs**
 - New technologies, energy, vehicles, etc
 - Funding opportunities
 - Regulation
- **Evaluate Progress**




Phoenix.gov/Sustainability

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Google™ Custom Search

81F A Few Clouds | 2:13 PM | Mar. 17, 2009

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Environment and Sustainability

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[Pollution Prevention \(P2\)](#)
[Environmental Awareness](#)
[Additional Resources](#)



The city of Phoenix has long been recognized as an environmental leader. The mayor, City Council, management and staff are all committed to protecting the environment and providing a sustainable future for the city residents.

In this section you will find information on the city's wide range of environmental programs. The Sustainability Summary provides an overview of more than 80 city programs that have helped us thrive in our unique and beautiful desert environment. The links here also will provide information on air quality, buying environmentally preferred products, reducing litter and the city's Environmental Quality Commission.

Phoenix's sustainability motto, "Living Like it Matters!" reaffirms the sustainability creed that guides its current programs and future plans.

Related Links

- » [Office of Environmental Programs](#)
- » [Environmental Quality Commission](#)
- » [Keep Our City Clean](#)
- » [Recycling Information](#)
- » [Household Hazardous Waste](#)
- » [Phoenix General Plan](#)
- » [Geographical and Weather Info](#)
- » [Storm Water Contamination](#)
- » [Carpool and Vanpool](#)
- » [Public Transportation](#)


More Information About Phoenix's Environmental Sustainability

- [Read the City's Sustainability Program Summary](#)
- [Protect the Environment at Home](#)
- [View Phoenix's Environmental Awards](#)
- [Discover the Urban Forest Resource Program](#)

- [City Solar and Renewable Energy Projects](#)
- [Find Environmental Contact Information](#)
- [Learn How to Buy Green Products](#)


Sustainability Program

Find out what the city is doing to demonstrate its commitment to environmental stewardship



Water Conservation

Get information about how to use water wisely in our desert environment





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